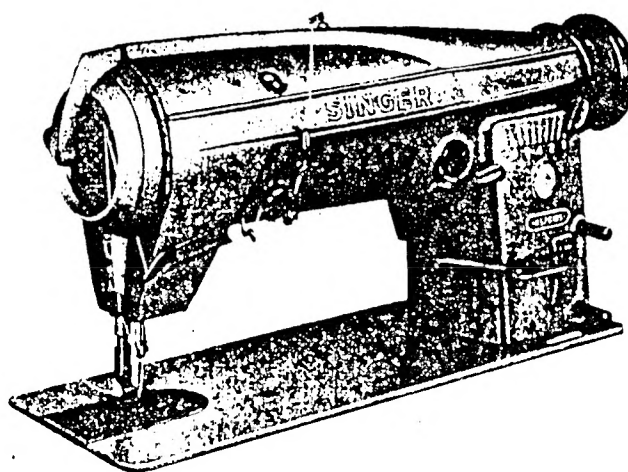


SERVICE MANUAL
FOR
SINGER
SEWING MACHINE



457 G 105
457 G 115
457 G 116
457 G 117

T H E S I N G E R C O M P A N Y

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DESCRIPTION

- The 457 G 105** Machine is a high speed, single needle, reverse feed, lock stitch, long arm zigzag sewing machine for stitching light and medium fabrics.
- The 457 G 115** Machine incorporates the same features as the 457 G 105 machine, however, it is equipped with a foot treadle, which allows the feed to be reversed either by hand lever or by the foot treadle.
- The 457 G 116** Machine differs from the 457 G 115 machine by a longer stitch length and a special canvassing hook. The stitch length of the 457 G 116 machine is 3-1/2 stitches per inch = 7.3 mm per stitch.
These features render it especially suitable for canvassing operations.
- The 457 G 117** Machine incorporates the same features as the 457 G 115 machine, however, it is equipped with a special canvassing hook and therefore also a suitable machine for canvassing operations.

The following paragraphs concern the 457 G 105, 457 G 115, 457 G 116 and 457 G 117 machines unless otherwise stated.

The machine specifications are as follows:

1. Needle Bar Stroke 1-5/16 inch = 33.40 mm
Presser Bar Lift 9/32 inch = 7.14 mm
Maximum Width of 3-Stitch Zigzag 5/16 inch = 8.00 mm
Space right of Needle 11-5/16 inches = 287.90 mm
Maximum Length of Stitch 5 stitches per inch = 5.10 mm per stitch
Bed 18-49/64 inches long, 7 inches wide = 476.65 mm long, 177.80 mm wide
Machine Pulley (Safety Type) for 3/8 inch = 9.50 mm V-belt
Outside diameter of belt groove 2.9 inches = 73.65 mm
Effective diameter for 5/16 inch = 7.93 mm round leather belt
2-3/8 inches = 60.30 mm
Head End Location for Singer Light No. 625024-501
2. Automatic lubricating system for supplying oil to all moving parts which can be observed through an oil flow window at the front of the machine arm.
3. Transverse, two to one, horizontal axis rotary hook, automatically pressure lubricated and with fine adjustments for the oil flow.
4. Single rotary take-up which controls thread at all times to meet the requirements of the hook.
5. Adjustable tension releasing device used with a disc tension or an optional rotary tension.
6. Needle vibrating mechanism with needle position and bight adjustable by means of two separate hand levers. The different settings are indicated on the front arm cover.
7. Combination of forward and reverse feed with two stitch length regulating screws to set the required forward and reverse stitch lengths. The stitch length settings can be read from a stitch length indicator plate. The reverse feed is actuated by a hand lever.
8. Pendant link mechanism with eccentric for adjusting the feed dog to height and parallelism.
9. The arm shaft and the belt end of the bed shaft are mounted in double-shielded ball bearings. Needle bearings are provided for the needle bar connecting link and Super Oilite bushings for the feed driving rock shaft and the needle bar yoke shaft.
10. Removable arm and bed covers permit accessibility to all parts in the machine.
11. Vibration absorbing location of the machine in the machine base which is firmly mounted as oil pan and oil reservoir in the table.

SPEED (Figure 1)

The maximum speed recommended for the 457 G 105, 457 G 115 and 457 G 117 machines is 5.000 R.P.M.

The maximum speed recommended for the 457 G 116 machine is 3.800 R.P.M.

The maximum speed recommended for these machines is depending on materials used and operations performed.

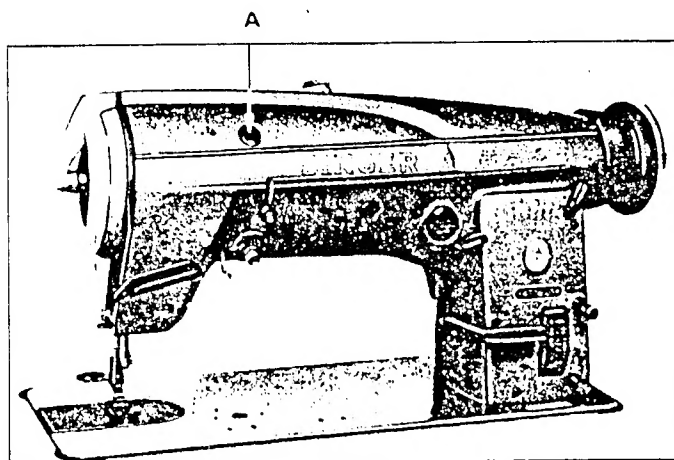


Figure 1

It is advisable to run a machine at a more moderate speed until an oil flow is visible in the oil flow window "A", Fig. 1, and this speed should be maintained for several minutes.

CAUTION: The machine pulley must always turn over toward the operator when the machine is in operation.

SETTING UP (Figures 2 and 3)

The machine rests on a cork gasket in the machine base which also serves as drip pan, oil reservoir and as support for the knee lifter and the feed reversing parts required when the feed reversing mechanism is actuated by foot.

When using the SINGER-table the machine base rests on its four corners and is fastened by means of wood screws furnished with the machine. Any table cutout into which the machine base cannot be inserted properly must be reworked or adjusted by shims so that the machine base

1. does not rock
2. is level in both directions
3. prevents the inserted machine from touching the table,
4. raises the inserted machine above the table, enough to open the bed slide and that the bed hinge connections support the machine only when it is tilted back.

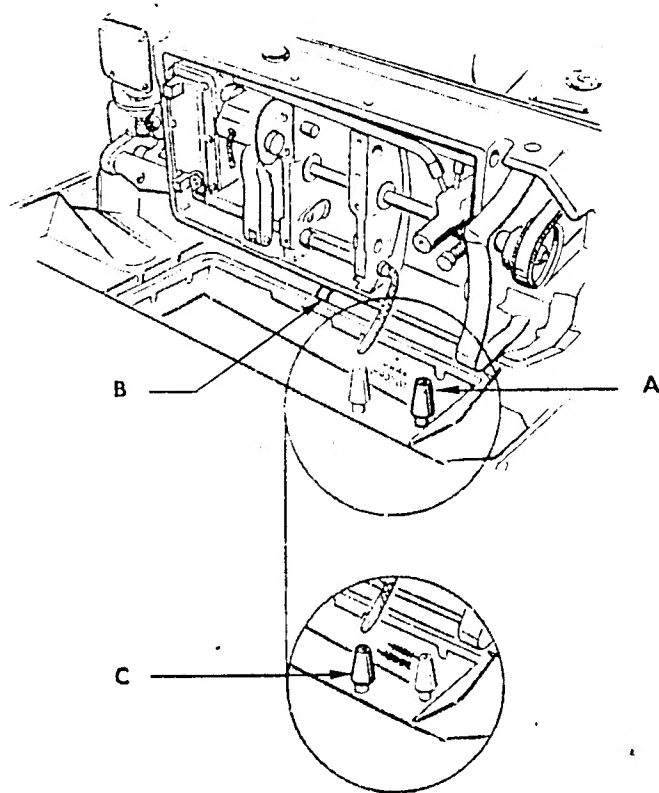


Figure 2

When assembling the knee lifter make certain that the knee lifter pin "C", Fig. 2, is properly inserted to connect the knee lifter mechanism of the machine with that of the machine base. The lifting range of the knee lifting lever is limited by pin "A", Fig. 2, (no lifting) and by screws "B", Fig. 3, (full lifting). When using the full lifting range, the lifted presser bar lifter must disengage.

As regards the 457 G 105 machine the direction of feeding can only be changed by means of a hand lever.

As regards the 457 G 115, 457 G 116 and 457 G 117 machines, the directions of feeding can be changed by a hand level and a foot treadle.

When the feed reversing mechanism actuated by foot is desired the feed reversing lever "C", Fig. 3, replaces the collar and the feed reversing plunger "C", Fig. 2, replaces the plug in the machine base.

The static grounding contact "C", Fig. 2, with grounding contact wire, furnished with the machine, provides for the static grounding of the machine and will be fastened at the rear side of the machine base in such a manner that a contact with the machine bed is obtained. The paint should be removed from the contacting area of the machine bed and the grounding contact be fastened at the rest plate of the motor.

CAUTION: Do not start the machine, not even to test the speed, until it has been thoroughly oiled as instructed below.

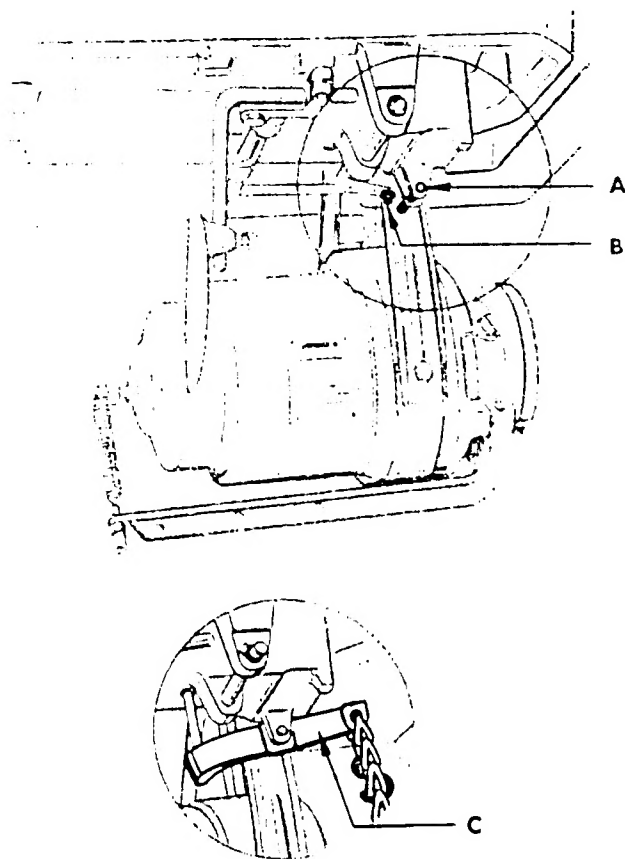


Figure 3

LUBRICATION (Figure 2)

Use only "Type C" SINGER Oil, for the automatic lubrication of the machine. This type of oil assures a troublefree lubrication and increases the life of the machine.

Before starting the machine fill the oil reservoir in the machine base up to the "HIGH" mark, Fig. 2. The screw-type pump mounted in the machine bed supplies oil to the hook and to all the machine parts requiring oil. The oil pump is protected against dirt by a screen thus assuring the oil supplied is clean.

The level of the oil should be checked daily and refilled when necessary. Never allow the oil level to drop below the "ADD OIL" mark, Fig. 2.

The oil screen should be kept clean and the period between cleanings will depend upon the operation performed and the material being used.

ADJUSTMENT OF THE OIL FLOW FOR THE HOOK LUBRICATION (Figure 4)

The regulating screw "A", Fig. 4, locked in place by a lock nut and located at the head side of the hook shaft gear box, regulates the oil flow for the lubrication

of the hook. The oil flow is set at the factory for automatic lubrication of the hook under normal sewing conditions. In general, the normal adjustment can be made as follows: Turn the regulating screw in to its closed position and then loosen by approx. 2-1/2 turns. To increase the flow of oil to the hook the regulating screw is turned clockwise, to decrease it the regulating screw is turned counter-clockwise.

The oil wick "B", Fig. 4, in the oil filter screw at the front end of the hook shaft must be replaced occasionally as it may have collected lint or other foreign matter causing an insufficient supply of oil to the hook.

If the hook receives an excessive amount of oil which cannot be reduced by the regulating screw, check to be sure that

1. the oil wick has not become detached from the filter screw,
2. the filter screw is securely tightened,
3. the oil return passages in the hook shaft, the bushing or in the hook bushing housing have not become clogged with lint or other foreign matter.

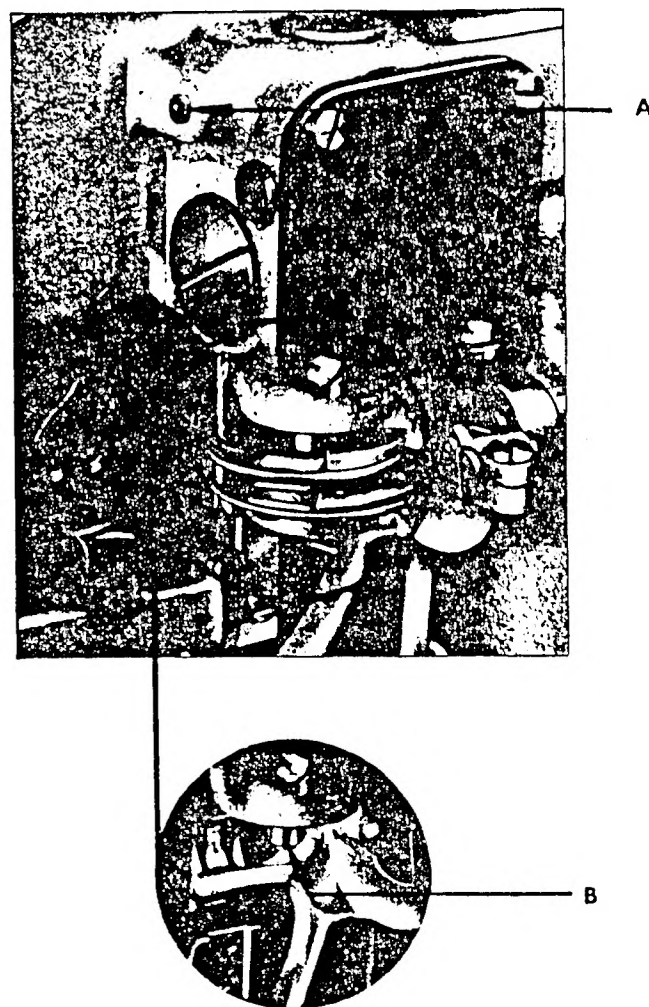


Figure 4

Place the bobbin onto the bobbin winder spindle sliding it on the spindle to its stop. Next pass the thread through the thread guide in the tension bracket "B", Fig. 7, and between the tension discs to the bobbin.

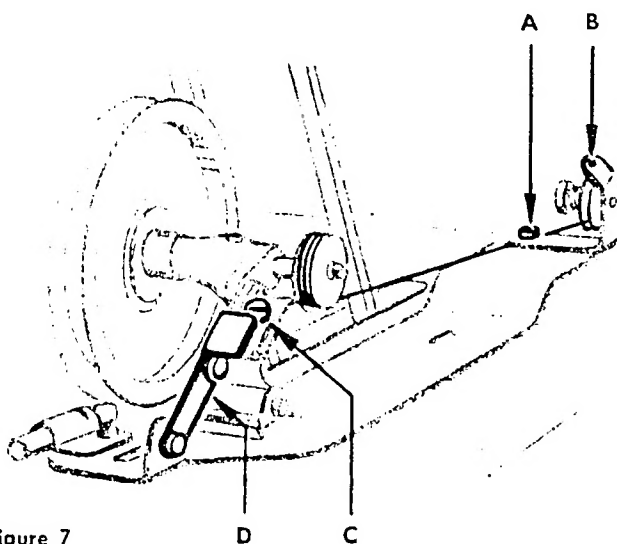


Figure 7

Then wind the end of the thread around the bobbin a few times and push the bobbin winder pulley against the machine belt and start the machine. When sufficient thread has been wound on the bobbin, the bobbin winder will stop automatically. If the thread does not wind evenly, loosen screw "A", Fig. 7, at the tension bracket and move the bracket to the right or left as may be required, then tighten screw "A", Fig. 7. The amount of thread wound on the bobbin is regulated by screw "C", Fig. 7.

For more thread, the screw is turned clockwise; for less thread, it is turned counter-clockwise.

Bobbins can be wound while the machine is in operation.

CAUTION: Synthetic threads should be wound with the smallest tension possible.

TO THREAD THE BOBBIN CASE

(Figures 8 and 9)

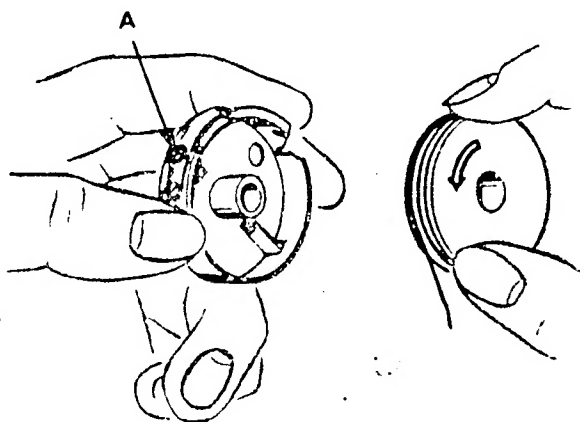


Figure 8

Hold the bobbin between thumb and forefinger of the right hand as shown in Fig. 8 so that the thread will unwind to the left.

Hold the bobbin case with the left hand as shown in Fig. 8, with the spring upward and place the bobbin into the bobbin case.

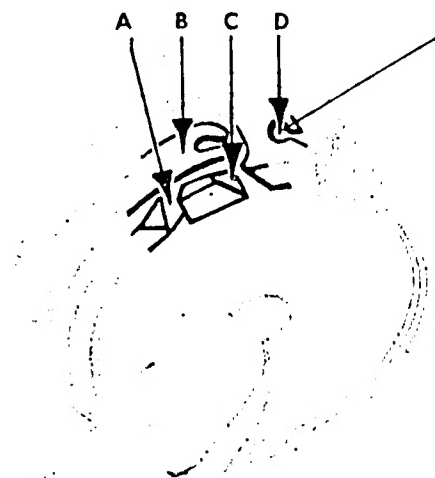


Figure 9

Pull the thread into the slot "A", Fig. 9, under spring "B", Fig. 9, through the next slot "C", Fig. 9, into the bobbin case and lead the thread out through the third slot "D", Fig. 9.

TO REPLACE THE BOBBIN CASE

After threading take the bobbin case by the latch and place it on the center stud of the bobbin case base holder. Release the latch, press the bobbin case until the latch engages in the groove near the end of the stud. Allow about 2 inches = 50.8 mm of thread to hang free and close the bed slide.

TO SET THE NEEDLE

Turn the machine pulley toward the operator until the needle bar reaches its highest point. Loosen the needle set screw at the lower end of the needle bar and push the needle into the bar to the needle stop with the long groove and the eye facing the operator. Then securely tighten the needle set screw.

UPPER THREADING (Figure 10)

As soon as the operator has become accustomed to threading the machine, the thread can be passed with a single continuous motion from the thread guide to the needle eye.

First, turn the machine pulley toward the operator until the needle is at its highest point. From the spool

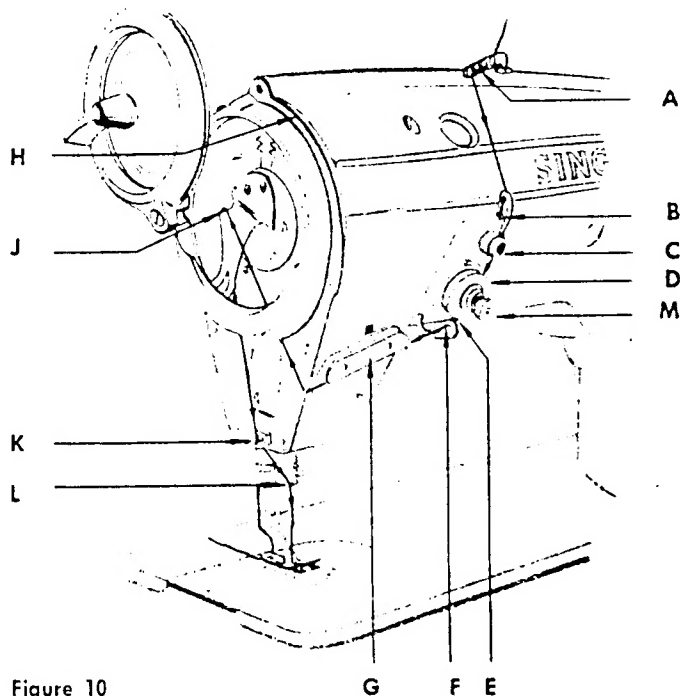


Figure 10

holder pass the needle thread from right to left through the rear hole of the thread guide "A", Fig. 10, on the arm cover and then from left to right through the front hole. Now draw the thread from right to left through the upper hole of the thread guide "B", Fig. 10, on the pretension and from left to right through the lower hole. Insert the thread from the right into the pre-tension "C", Fig. 10, pull it through the tension discs "D", Fig. 10, and lead it over the thread take-up spring "E", Fig. 10, under the thread pull-off "F", Fig. 10, and to the thread guide hole of the long thread guide "G", Fig. 10. Then pass the thread through the opening in front of the face plate "H", Fig. 10, over the thread take-up lever "J", Fig. 10, down through the thread guide eye "K", Fig. 10, through the needle bar thread guide "L", Fig. 10, and from front to rear through the eye of the needle.

TO PREPARE FOR SEWING

With the left hand hold the slack end of the needle thread loosely and turn the machine pulley toward the operator until the needle moves down and up again to its highest point thus catching the bobbin thread. Then draw up the needle thread and the bobbin thread will come with it. Lay both threads back under the presser foot.

TO REGULATE THE TENSIONS (Figures 8, 10, 11, 12 and 13)

The regulation of the needle and bobbin thread tensions is dependent on the thread and material to be used.

The tension on the needle thread should be regulated only when the presser foot is down and the thread tension is not released.

The tension is regulated by means of the tension thumb nut "M", Fig. 10. The disc tension mounted onto the machine at the factory will preferably be used for the conventional type of sewing operations whereas for special operations requiring the use of synthetic threads the rotary tension No. 502663 will be supplied as an optional port.

The tension on the bobbin thread is regulated by the small regulating screw "A", Fig. 8, in the bobbin case cap tension spring. Turning it clockwise increases and turning it counter-clockwise decreases the tension. At standard setting (= for normal sewing) the bobbin thread should just carry the weight of the bobbin case cap with the inserted bobbin.

The needle and bobbin threads should be locked in the center of the thickness of the material, Fig. 11, when the tensions are correctly regulated.



Figure 11

If the tension on the thread is too tight, or if that on the bobbin thread is too loose, the needle thread will lie straight along the upper surface of the material, Fig. 12.

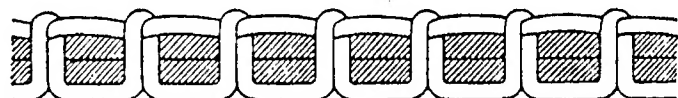


Figure 12

If the tension on the bobbin thread is too tight, or if that on the needle thread is too loose, the bobbin thread will lie straight along the underside of the material, Fig. 13.

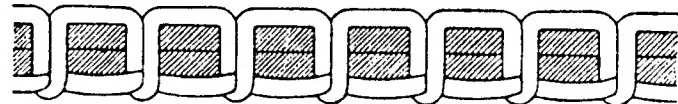


Figure 13

TO SET THE NEEDLE POSITION AND THE WIDTH OF THE ZIGZAG STITCH (Figure 14)

The needle position and the width of the zigzag stitch can be set while the machine is running.

The three needle positions, right, left and center, indicated by symbols on the front arm cover are selected by moving the hand lever "A", Fig. 14.

The bight is infinitely variable within the specified range and can be set by the hand lever "B", Fig. 14, as desired. Graduated indications located on the front arm cover and ranging from 0 (zero bight) to 8 (maximum bight = $\frac{5}{16}$ inch = 8 mm) show the different settings.

TO SET THE STITCH LENGTH FOR FORWARD AND REVERSE FEEDING (Figure 14)

With the machine in operation, the stitch length can be set by adjusting screw "E", Fig. 14, for forward and by adjusting screw "F", Fig. 14, for reverse feeding. The stitch length, in number of stitches per inch, is shown on the stitch length indicator plate "D", Fig. 14. The upper mark, Number 5, on the plate will indicate the

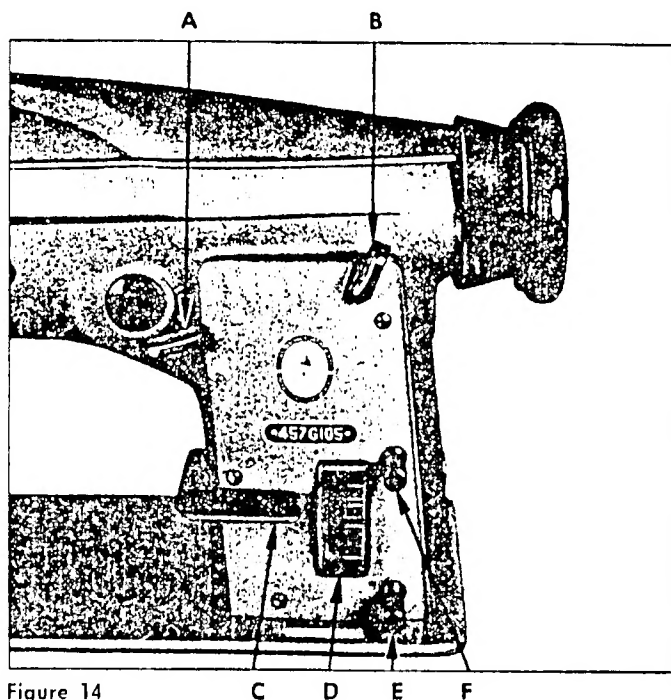


Figure 14

longest stitch (5 Stitches per inch = 5.1 mm per stitch) in forward feeding whereas the lower mark shows the longest stitch in reverse feeding. Within this range any stitch length as desired can be obtained by moving the hand lever "C", Fig. 14, on the 457 G 105 or the foot treadle on the 457 G 115, 457 G 116 and 457 G 117.

When the stitch length indicator plate "D", Fig. 14, has timing marks only:

The stitch length, indicated by timing marks, is shown on the stitch length indicator plate "D", Fig. 14. The uppermost timing mark indicates the maximum stitch length in forward feed, while the lowermost timing mark indicates the maximum stitch length in reverse feed.

After setting the adjusting screws to the desired stitch length for both forward and reverse feeding, the actual stitch length can be changed within these limits by moving the hand lever "C", Fig. 14.

TO CHANGE TO REVERSE FEED (Figure 14)

As regards the 457 G 105 machine the direction of feeding can only be changed by means of a hand lever.

As regards the 457 G 115, 457 G 116 and 457 G 117 machines, the direction of feeding can be changed by a hand lever and a foot treadle.

Reversing the feed by foot treadle requires installing the feed reversing foot control lever "C", Fig. 3, and the feed reversing foot control plunger "C", Fig. 2, as described under "SETTING UP", Page 5, as well as connecting the feed reversing foot control chain to the feed reversing foot control lever "C", Fig. 3.

TO CLEAN THE HOOK AND THE THREAD WAYS (Figure 15)

In order to preserve the life of the hook it is necessary to clean the hook by means of a brush once or twice daily depending on the materials used.

Two thread cutters "A", Fig. 15, are mounted in the thread ways at the rotary take-up to avoid wrapping of the upper thread on the take-up. After each upper thread breakage the rotary take-up must be checked for any remains of thread. These remains must be removed before rethreading.

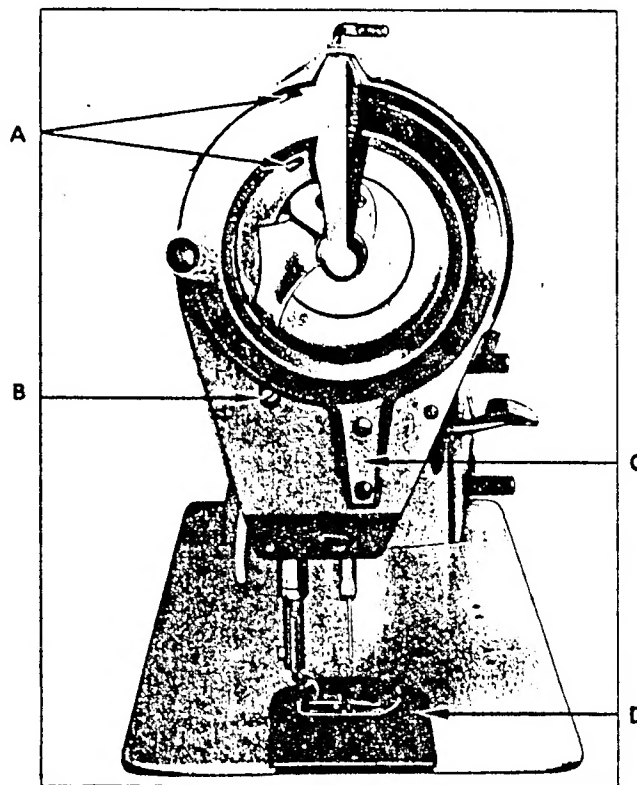


Figure 15

TO SET THE THREAD TAKE-UP SPRING (Figure 16)

The thread take-up spring "C", Fig. 16, set at the factory for normal sewing conditions, must have sufficient free movement to complete its action and should be at rest against the upper end of the thread take-up spring regulator "B", Fig. 16, when the point of the needle in its downward stroke penetrates the material.

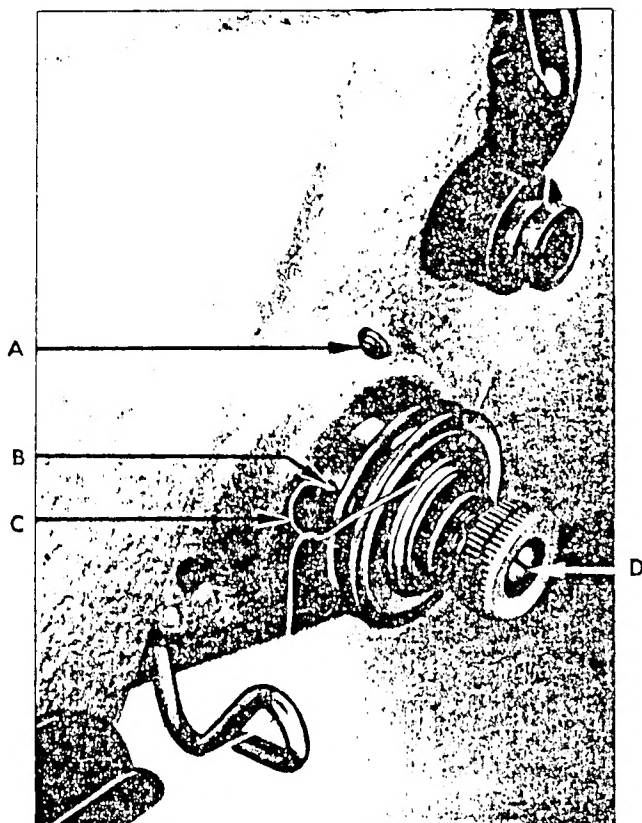


Figure 16

The action of the spring should be sufficient to assure a light tension on the thread when same passes around the bottom of the bobbin case and casts off the hook point.

By loosening the tension retaining screw "A", Fig. 16, the tension complete can be rotated until the spring regulator is in the desired position.

The tension of the thread take-up spring is set by turning the tension stud "D", Fig. 16, either toward the right to increase it or toward the left to decrease it, with the screw "A", Fig. 16, securely tightened.

The tension on the thread take-up spring should be sufficient to insure its action at top speed; however, it should be light enough so that the spring will move all the way down before the thread is pulled through the tension discs. The tension on the thread take-up spring requires different settings depending upon the size of the thread and other particular sewing conditions.

TO SET THE PRESSER BAR (Figure 15)

In order to align the presser foot with the needle, lower the presser foot onto the throat plate and loosen the presser bar position guide pinch screw "B", Fig. 15, through the opening in the face plate. Then move the presser foot into the desired position and securely tighten the pinch screw. The presser bar lifter must be set so that a presser bar lift of $\frac{9}{32}$ inch = 7.15 mm is obtained.

TO REGULATE THE PRESSURE OF THE PRESSER BAR ON THE MATERIAL (Figure 17)

The pressure of the presser bar on the material is regulated by the presser bar spring screw "B", Fig. 17, through the opening in the arm cover. To increase the pressure turn the spring screw clockwise (in), to decrease the pressure turn the spring screw counter-clockwise (out).

CAUTION: The pressure on the material should be as light as possible while still sufficient to insure proper feeding.

TO SET THE TENSION RELEASER (Figure 17)

The tension is automatically released (i. e. the pressure on the tension discs) when the presser foot is lifted to its highest point by means of the presser bar lifter or the knee lifter.

The tension release can be adjusted by means of the regulating screw "C", Fig. 17, to act sooner or later.

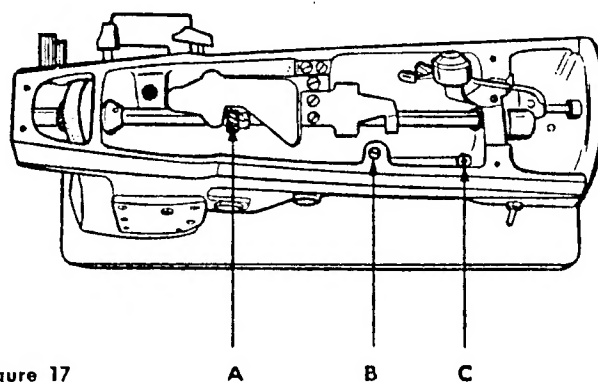


Figure 17

TO SET THE NEEDLE BAR AT THE CORRECT HEIGHT (Figures 15 and 18)

The correct needle bar height from the throat plate seat to the needle stop in the needle bar, measured when the needle bar is at its lowest position, is 1.043 inch = 26.50 mm.

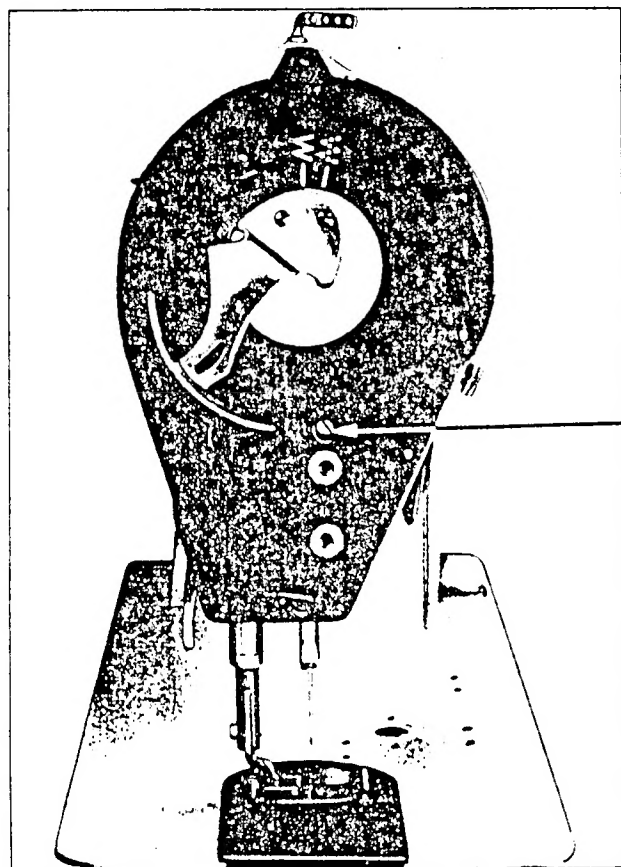


Figure 18

To set the height, first remove the throat plate "D", Fig. 15, and the rotary take-up guard "C", Fig. 15, by loosening the appropriate screws. Then an auxiliary setting gauge should be made by shortening a heavy blade needle at its point such that the complete needle plug length together with the thickness of the throat plate equal the exact setting dimension as specified above. The needle plug gauge is inserted into the needlebar to its stop and fastened. Through the access opening "A", Fig. 18, in the face plate loosen the needle bar set screw in the connecting stud just enough to permit adjustment of the needle bar. Replace the throat plate under the needle plug, turn the machine pulley until the needle bar is at its lowest position and the plug touches the solid surface of the throat plate. Then continue to turn the machine pulley until the needle bar set screw is visible in the opening "A", Fig. 18, of the face plate. Tighten the needle bar set screw and reassemble the throat plate and the rotary take-up guard in their proper positions.

CAUTION: Whenever the height of the needle bar has been changed check the relationship of hook point to needle.

TO TIME THE HOOK (Figures 14, 19 and 20)

The hook point "A", Fig. 19, should be set to the center line of the needle in center needle position and at straight stitch setting of the machine (needle positioning lever "A" on the appropriate symbol and needle vibrating lever "B" on "O" bight as shown in Fig. 14) when the timing mark "A", Fig. 20, on the face plate is in line with the timing mark "B", Fig. 20, on the rotary take-up.

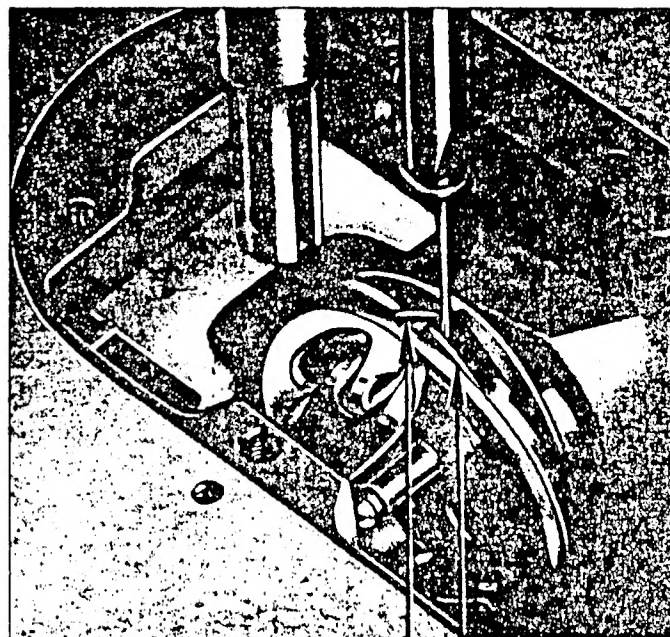


Figure 19

A B

The needle should clear the hook point and contact the needle guard "B", Fig. 19, without deflection.

For proper timing of the hook remove the presser foot, the slide plate, the throat plate, the feed dog and

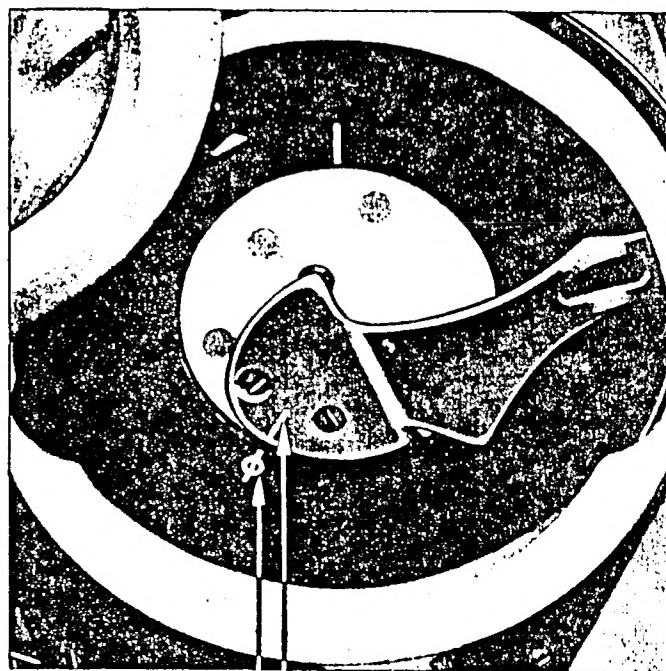


Figure 20

A B

the bobbin case. Make certain that the height of the needle bar has been set correctly. Insert a new needle into the needle bar, loosen the two set screws in the hub of the hook and while holding the machine pulley (keeping the timing marks matched) rotate the hook until the hook point is at the center line of the needle. Retighten the hook set screws. Check the clearance between the hook point and the needle in the extreme positions of the widest bight.

CAUTION: The hook point should pass the needle as closely as possible without, however, touching it.

The function of the needle guard is to prevent hook point damage when the needle is deflected into the path of the hook point. Whenever the hook has been replaced check the needle guard for proper adjustment. If any adjustment is required, this can be made by bending the guard with a screw driver without, however, upsetting the position of the hook.

TO ADJUST THE FEED DRIVING MECHANISM (Figures 2, 14, 21, 22, 23 and 24)

The stitch length and the feeding direction can be adjusted by the feed driving mechanism as instructed under "TO SET THE STITCH LENGTH FOR FORWARD AND REVERSE FEEDING" and "TO CHANGE TO REVERSE FEED", Page 9.

The stitch length setting as selected and indicated on the stitch length indicator plate "D", Fig. 14, is transmitted by connecting rods via the feed regulating connecting shaft "H", Fig. 21, to the carrier frame "B", Fig. 21. This carrier frame with its slide stud guiding

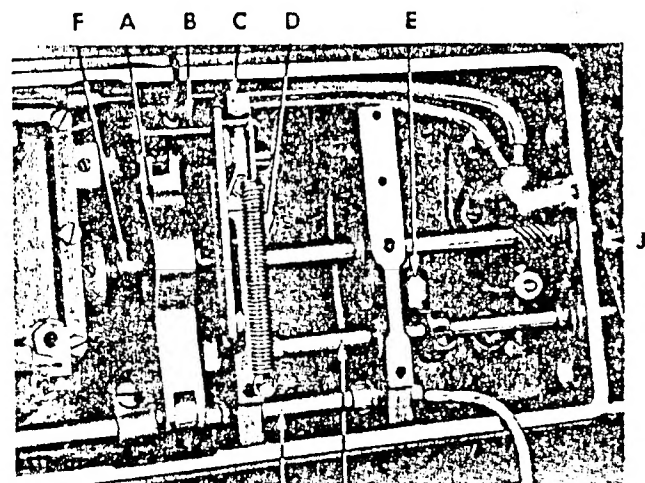


Figure 21

the bearing of the feed driving connection "A", Fig. 21, controls the movement which is derived from the feed driving eccentric "F", Fig. 21, and transmitted via the feed driving rock shaft "G", Fig. 21, to the feed dog. An adjustable tension spring "D", Fig. 21, serves to maintain the carrier frame in its position as selected by the adjusting screw "E", Fig. 14, or to return the frame from reverse to forward feeding position. The maximum range of the carrier frame movement is limited by stop "C", Fig. 21.

Machine 457 G 115, 457 G 116 and 457 G 117 only:
When using the foot treadle for forward and reverse

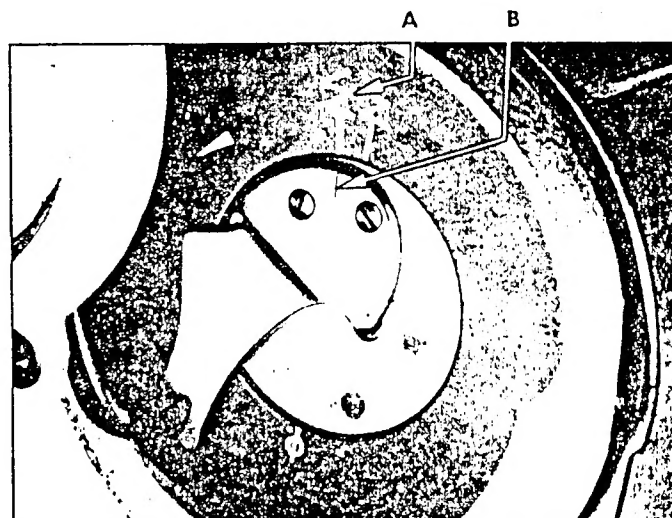


Figure 22

feeding the feed reversing connecting lever "D", Fig. 21, must be adjusted to the feed reversing plunger "C", Fig. 2.

For timing the feed driving mechanism in relation to the needle movement, check the position screw location of the feed driving eccentric "F", Fig. 21, in the splined groove of the bed shaft. The position screw is the first to appear when the machine pulley is turned in the normal direction of rotation. Then set the stitch length indicator on mark "O" of the stitch length indicator plate "D", Fig. 14, by regulating the two adjusting screws "E" and "F", Fig. 14. After loosening the pinch screw of the stitch length indicator "K", Fig. 28, which is accessible from below the bed, adjust the carrier

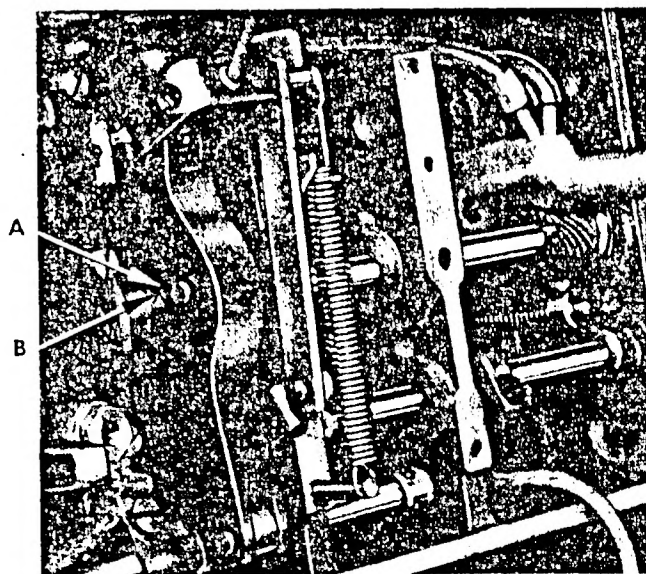


Figure 23

frame such that there is no feeding movement while the machine is still in operation and then retighten the pinch screw.

When the stitch length indicator has timing marks only:

TO SET THE NEEDLE VIBRATING MECHANISM (Figures 17, 26, 27 and 28)

The needle position and the width of the zigzag stitch can be changed by the needle vibrating mechanism as

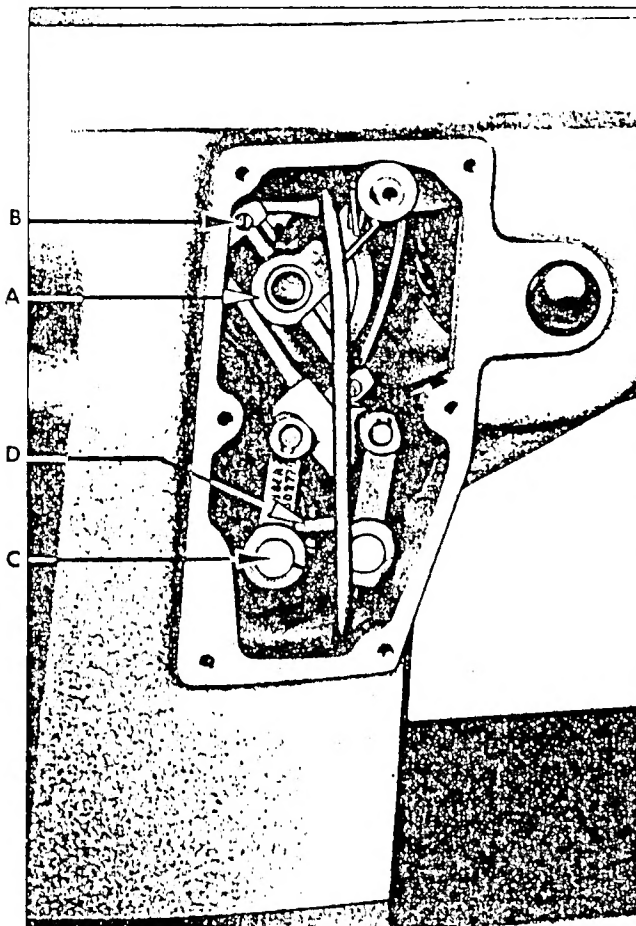


Figure 26

instructed under "TO SET THE NEEDLE POSITION AND THE WIDTH OF THE ZIGZAG STITCH", Page 14, while the machine is running.

The movement of the hand lever "F", Fig. 28, which sets the required bight within a range from 0 to 8 mm is transmitted via the needle vibrating adjusting shaft "C", Fig. 26, and a parallelogram linkage to the carrier frame "B", Fig. 26, which is held in its position by an adjustable clamping bracket "D", Fig. 26, functioning as a resisting member to the movement of the carrier frame. This carrier frame with its slide stud guiding the bearing of the driving connection "A", Fig. 26, controls the movement which is derived from the double eccentric drive and transmitted to the needle bar yoke. Due to the arrangement of the two eccentrics "C", Fig. 27, which are pinned to the needle vibrating eccentric shaft "B", Fig. 27, the needle vibrating mechanism virtually eliminates the lateral movement of the needle while penetrating the material. For functional and lubrication reason the position of the eccentrics "C", Fig. 27, should never be changed. The needle vibrating mechanism

driven by the needle vibrating pinion "A", Fig. 17, on the arm shaft can be assembled only as complete part together with the driving connection "A", as illustrated

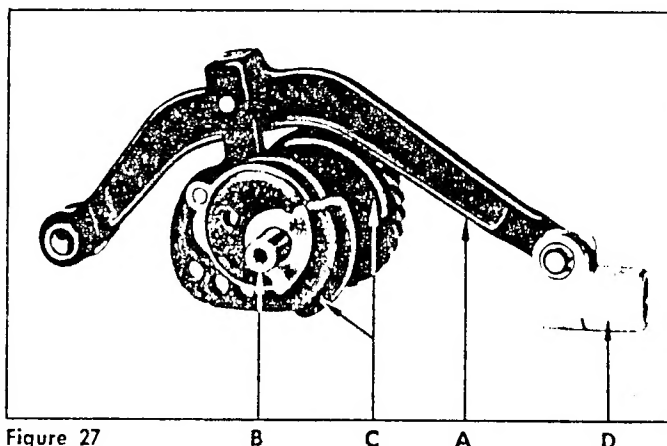


Figure 27

in Fig. 27. Subsequently the front bearing bushing "A", Fig. 28, is mounted into the machine arm.

The movement of the hand lever "B", Fig. 28, within the three step needle positioning range is transferred to the carrier frame "B", Fig. 26, by means of the eccentric bushings "C" and "D", Fig. 28, which are adjusted by the slide block bracket "H", Fig. 28. The eccentrics effect the linear movement of the carrier frame which, in turn, results in the desired positioning of the needle bar.

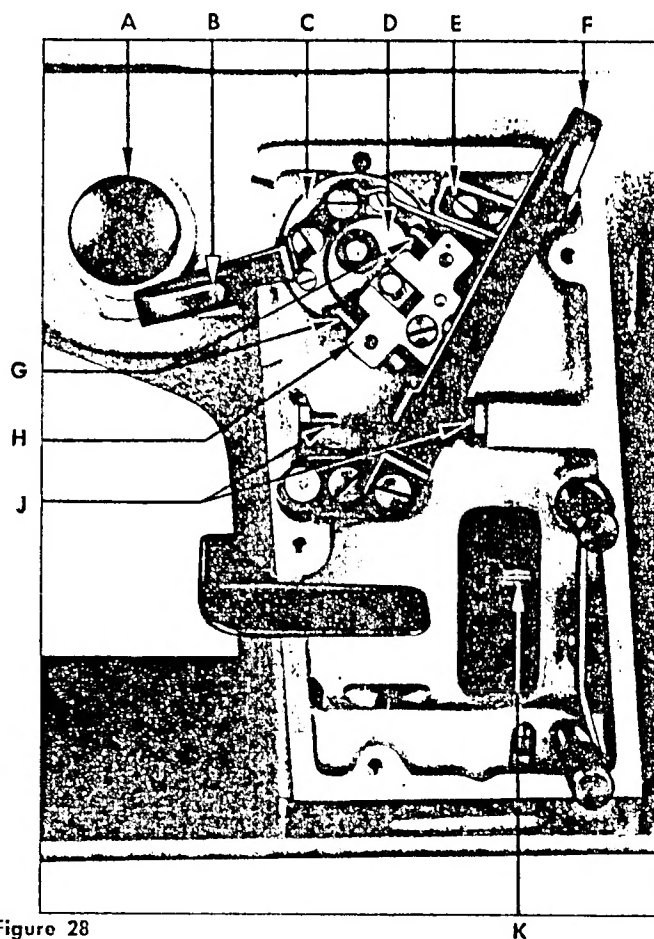


Figure 28

To time the needle vibrating mechanism, check first if the center needle position maintained by the adjustable position spring "E", Fig. 28, is adjusted such that the timing mark on the eccentric bushing "D", Fig. 28, is in line with the timing mark on the eccentric bushing "C", Fig. 28. Then set the hand lever "F", Fig. 28, on zero bight (0) or maximum bight (8) respectively and make sure that with the lever resting against the corresponding stop screws "J", Fig. 28, the needle throw is 0 mm at zero bight setting and 8 mm at maximum bight setting while the needle bar completes a full up and down movement.

To adjust the right and left needle positions, the hand lever "B", Fig. 28, must rest against the corresponding stop screws "G", Fig. 28, which are to be adjusted such that the needle bar in its lowest position does not show any movement while the needle vibrating hand lever "F", Fig. 28, is being shifted within the complete bight range.

The timing of the needle vibrating mechanism in relationship to the needle bar movement is set in center needle position and at the widest bight. Adjust the zig-zag movement to the up and down movements of the needle bar by turning the needle vibrating pinion "A", Fig. 17, on the arm shaft so that the needle movement in the right and left penetrations is as small as possible.

TO SET THE NEEDLE BAR YOKE (Figure 29)

The needle bar yoke controlled in its movement by the needle vibrating mechanism must be adjusted such that the needle penetration in the center needle position and at zero bight setting is in the center of the throat plate needle hole. After loosening the pinch screw of the driving connection hinge bearing "D", Fig. 27, set the needle bar yoke to the center of the throat plate needle hole. Retighten the pinch screw.

The front to back adjustment of the needle bar yoke is possible through the guide studs "D" and "C", Fig. 29, located near the lower needle bar bushing and secured by lock screws to prevent shifting. The needle bar yoke can be adjusted with the guide studs such that the yoke and the needle bar connecting stud and link are perfectly in line for free operation.

The rear needle bar guide stud "D", Fig. 29, the needle bar connecting stud guide block "A", Fig. 29, and the needle bar connecting link guide block "B", Fig. 29, have been adjusted at the factory. These adjustments should not be changed.

Whenever a replacement of the needle bar yoke is required, a new adjustment must be made by using the setting gauge No. 503659 which can be obtained from SINGER Agencies.

TO REPLACE THE ARM SHAFT CONNECTION BELT (Figures 23 and 24)

Remove the needle to avoid damage to the hook. Slide belt off the lower pulley, loosen the two screws in the machine pulley and remove the machine pulley with the ball bearing from the arm shaft. Lift the belt up and draw it around the arm shaft through the space normally occupied by the ball bearing.

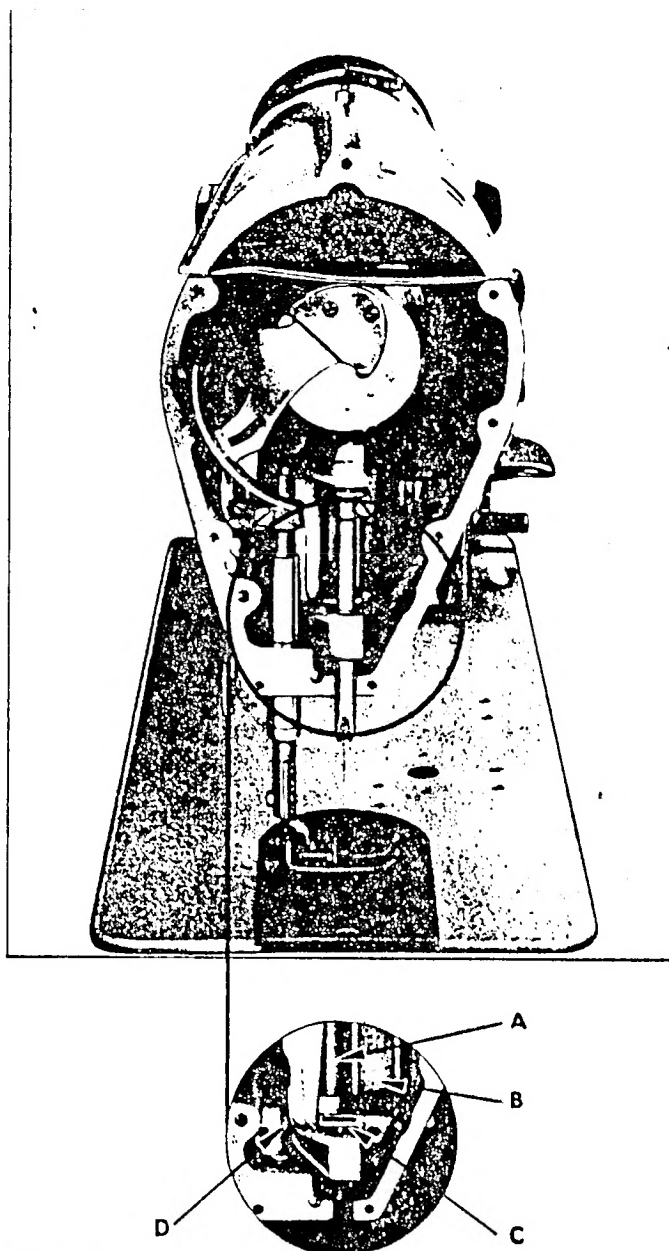


Figure 29

The new belt is inserted through the ball bearing hole. After placing belt over upper pulley, replace machine pulley. To remove all end play from the shaft, lightly tighten set screws in machine pulley and tap the machine pulley into position with the palm of the hand. Tighten the machine pulley set screws firmly.

Turn the machine pulley over toward you until the timing mark "B", Fig. 23, on the rotary take-up is in line with the timing mark "A", Fig. 23, on the face plate. Then turn the bed shaft to align the timing mark on the feed driving eccentric "B", Fig. 24, with the timing mark on the feed driving connection "A", Fig. 24. In these two positions slip belt over lower pulley.

After the needle has been reinserted, the relationship of needle to hook should be checked as instructed under "TO TIME THE HOOK", Page 20.